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UUM TAKING SOCIAL SCIENCE RESEARCH TO THE FORE

# science research at UUM

Researchers at UUM tell **Najua Ismail** about the commercial potential and societal benefits of their projects which include sustainable farming, face detection, and an IT system for SMEs.

## Stimulant for productive paddy farming

THE growing popularity of organic farming has inspired a group of researchers from UUM to come up with a plant growth stimulant or fertiliser, which they have dubbed 'soul of soil' to reflect its organic composition. The stimulant was invented through a simple production process that can be emulated in the backyard of any house. Soul of soil is a concoction of raw materials derived from nature such as bamboo shoots, banana stumps, various types of plants and animal excretion.

"We came up with soul of soil in response to the increasing awareness among consumers on the importance of health and environmental responsibility," says Dr Siti Norezam Othman who is leading the research team from the Special Research Interest Group in Agro Business under the School of Technology Management and Logistics, College of Business. "Consumers today want safe products that are free of toxins and other harmful chemicals."

Soul of soil is available in both granule and liquid form, which is also known as foliar. Working in collaboration with the Kedah Regional Development Authority (KEDA) and the Community in Kampung Lintang Belantik, in Sik, Kedah, the stimulant is being tested at an experimental organic paddy farm called Sri Lovely at the village.

According to Dr Siti Norezam, use of soul of soil on the farm has yielded positive results. The stimulant has been shown to improve soil pH, which increases the fertility level of the soil resulting in healthier plants. Other benefits include increasing the crop's resistance to diseases and greater root growth. In a nutshell, soul of soil has upgraded the productivity level of paddy farming at Sri Lovely.

"The farmers have said that paddy yield has actually improved with use of soul of soil, compared to conventional fertilisers," enthuses Dr Siti Norezam. She also points out that some organic fertilisers available in the market are not completely free of chemicals, which is why she believes that soul of soil will do well if it was more widely available. Her team is currently in discussion with the collaborative parties on the prospect of patenting, commercialising and mass producing the organic stimulant in the future by initially testing soul of soil with the Department of Agriculture before making a foray into the larger market.

## Warehouse management system for SMEs

**WITHOUT** a proper warehouse management system (WMS), looking for an item in a warehouse can be like rummaging for a coin in a huge sack of flour. However, a WMS does more than locate a product; it is the nucleus of operation for the entire supply chain in an organisation. It controls, monitors and manages all material flow within a supply chain.

e-GUDANG, a real-time warehouse management system with radio frequency and bar code technology, is the brainchild of a team of researchers from the School of Computing, College of Arts and Sciences. After conducting a survey to explore the potential market for WMS, the team led by Associate Professor Hatim Mohamad Tahir, decided to invent a system that would cater to small and medium enterprises (SMEs).

"We surveyed existing systems in the market and discovered that they are very expensive and cost millions of ringgit," explains Associate Professor Hatim. "SMEs have a limited budget and their warehouses are not as big as multinational companies."

According to him, most SMEs use in-house systems that have limited capabilities. In some cases, these systems focus exclusively on a single aspect of warehouse operations such as inventory or accounting.

e-Gudang offers a comprehensive approach to warehouse management as it takes into account the entire operational cycle in a warehouse from receiving and stocking goods to inventory control and retrieval of goods for order fulfillment. It provides an organised solution that includes software and communication devices, which will enable fewer people to do many tasks and be equipped with better information.

The system facilitates the storage of goods that is easy to organise without taking too much space, allowing for orders to be quickly fulfilled with minimum labour and cost. Additionally, its real-time intelligent reporting feature helps maintain accurate inventory control and reduces aging stock that causes inventory loss.

The e-Gudang module comprises: system configuration; receiving; picking; inventory; radio frequency technology (RFT); and business intelligence reporting. However, the system can be customised to suit the needs of a particular company, says Associate Professor Hatim. "e-Gudang can be integrated with existing systems and upgrades can be made to the system."

According to him, despite winning several competitions at the national and international level, e-Gudang is a difficult product to market. Nevertheless, UUM's Research and Innovation Management Center (RIMC) led by Associate Professor Dr Mohd Fo'ad Sakdan is working hard to commercialise e-Gudang. "SMEs are not very IT savvy so we have to educate the market on the need for this product."

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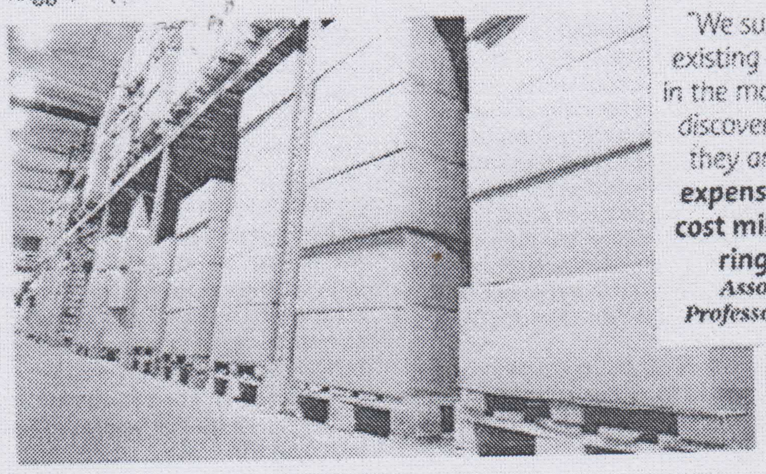

## It's all in the face

**IN 2010,** a Chinese man hit the headlines when he boarded an Air Canada flight disguised as an elderly Caucasian man. Although he was observed to have 'young looking hands', his true identity was not confirmed until he went to the bathroom and removed his disguise. The incident demonstrated that while the face is the most recognisable feature when it comes to identifying a person, it is also the feature that is easiest to camouflage.

According to Associate Professor Hatim Mohamad Tahir, from the School of Computing, College of Arts and Sciences, face recognition programmes can be used to manage security issues such as the above. Unfortunately, many of the face recognition programmes that have been developed fall short when it comes to fulfilling their function, he maintains. This is because most of them are susceptible to slight changes in the appearance of the face.

Associate Professor Hatim is leading a team of researchers in developing a Real-Time Face Recognition System Using Active Appearance Model Algorithms. "This system scans the entire face and compares it to an original database of faces," explains Associate Professor Hatim. The project, which was initiated last year, has a deceptively simple set-up which includes computer, camera, and software to link to the database.

However, the process of making sure the face recognition system is effective is a lengthy and tedious one that involves testing many faces not only just as they are, but with added embellishments such as moustache, headscarf, glasses, with make-up and without, and so on. "So far, we have tested several faces and their variations. But I will not be satisfied until we have tested hundreds of faces," asserts Associate Professor Hatim. "I am happy with our trials to date but I want to ensure that the system we develop will be 100 per cent reliable."

According to Associate Professor Hatim, their face recognition system could be marketed to the healthcare and transportation industry, financial institutions, the national registration department and police departments, as well as the government and private sectors. "Banks for example, could use it for their deposit box section," he elaborates.

He maintains that the system most commonly used in the country at the moment is fingerprinting. "This is an alternative to fingerprints. Face recognition provides another step to high security clearance," he avers.